



# DECLARATION

I, Manfred Groner, of Zürich, do solemnly and sincerely

declare as follows:

I am well acquainted with the English and German languages; and

The attached is an accurate translation into the English language of the certified copy of the document 1777/99 filed in the name of Weidmann Plastics Technology AG, in the Swiss Patent Office on September 29, 1999, in respect to an application for Patent.

/s/

Name:

July, 19, 2002

Date



## Showerhead

The invention relates to a showerhead with an outer casing, in which is arranged an adjustable valve with a valve body and a shut-off passing through this valve body. One end of the shut-off is arranged below a membrane that can be pressed in to adjust the shut-off, which changes the shower setting by pressing in the membrane from a first valve position to a second valve position against the retroactive force of a spring. There is also a reset mechanism, with which the shut-off can be moved from a second valve position to a first valve position against hydraulic pressure.

Showers of this type are generally known. They allow an adjustment of the jet, such as from a perlator to a spray. In such a process, the membrane is pressed in, moving the valve shut-off to a lower valve position. If there is adequate hydraulic pressure, the shut-off is held in this position and the water makes its way through openings that produce a spray. If the hydraulic pressure is less than 0.5 bar, for example, the spray setting is maintained. In order to switch back to the perlator setting, the shut-off must be lifted again. In the shower described in patent EP-A-0695490, this lifting takes place by means of a lever that is linked to the upper end of the valve body and arranged below the membrane. There are also other setting mechanisms with which the valve body can be lifted. One particular disadvantage of the implementation with the adjustment lever mentioned above is the relatively unfavorable handling, since activation requires finding the proper position of the membrane. The handling is made somewhat clearer through appropriate marking, however in many cases this is not practical.

The task of the present invention is to provide a shower of the type mentioned above, which is easy to operate and can nevertheless be manufactured with a small number of sturdy parts. The shower should also function well and be inexpensive to produce.

This task is solved through the shower of the type according to claim 1.

In the showerhead according to the present invention, the membrane is therefore integrated in a rotating cover. The membrane is domed, protruding on the upper side of the showerhead. Feeling for the suitable position on the membrane is therefore not necessary.

One important characteristic of the present invention is that the membrane and the cover can be produced as one unit with no space between them. Known showers of this type often have a groove below the handle. In the showerhead according to the present invention, such an interim space can be eliminated by arranging the membrane in the cover. This is especially advantageous for hygienic reasons and allows for easy cleaning of the showerhead.

The showerhead according to the present invention is reset by turning the cover, which at the same time turns the membrane integrated in the cover. Turning the cover is very simple and ergonomic. For example, a radially protruding activating knob can be molded on the cover.

The valve is preferably switched via a guide curve arranged on the valve body, which lifts the shut-off when the cover is turned. The valve is reset when the cover is turned clockwise or counterclockwise. A further development in which the position of the valve is stopped when the cover is turned in one direction is also conceivable. The advantage of such a stop is that the spray setting is maintained even if the hydraulic pressure drops below 0.5 bar.

The shut-off is preferably operated by a button-shaped button arranged at the upper end of the shut-off. This button preferably has a bowed surface on its upper side, which extends

somewhat parallel to the underside of the membrane. The extension is preferably large enough that the button can basically be moved downward to each position of the membrane.

According to a further development of the present invention, the cover is ring-shaped and the membrane is basically circular as viewed from above. The membrane is preferably snapped into the cover, or directly molded onto the cover in a two-polymer process. Such a process eliminates one part and simplifies the assembly process.

The dependent patent claims, the following description and the drawing yield further advantageous characteristics.

One sample implementation of the present invention is explained in more detail below with the help of the drawing, in which:

Figure 1 shows a cross sectional view of the showerhead according to the present invention, along line I-I of Figure 2,

Figure 2 shows a top view of the showerhead according to the present invention and

Figure 3 shows a cross sectional view through one part of the showerhead, along line III-III of Figure 2.

The showerhead has a casing 6 provided with a head piece 6a, onto which is molded a tube piece 6b, only a portion of which is shown here. The head piece 6a lifts a valve body 5 that is anchored in the casing 6 by prop cams 5d. A tubular insert 11 can be connected to the end of the water pipe, not shown here, in the usual manner. Said insert 11 directs the water through a passageway 11a to an opening 12 of the valve body 5. The insert 11 butts flush against the valve body 5 and is securely attached to the valve body 5 by a bolt 8 pushed in from above, and is also detachable.

According to Figure 3, the valve body 5 has an inner thread 15, into which a sieve 4 is screwed. Between the sieve 4 and the valve casing 5 is a cylindrical insert 10, which is interconnected at its circumference to the valve body 5 and which has a passageway 14. The sieve 4 is provided with a plurality of relatively small jet openings 18 for producing a spray.

In the valve body 5 is a shut-off 9 that has a valve position 9a, which in Figure 1 lies flush against a first and upper valve position 16. A cup-shaped button 3 is braced on the upper end of the shut-off 9. Said button 3 is held in the position shown in Figure 1 by a garter spring 7. This garter spring 7 is at the same time a torsional spring, which is explained in more detail below.

The button 3 has two radially protruding driver cams 3a, each of which is routed between two guide cams 1b, which is especially clear in Figure 2. Said guide allows a vertical movement of the button 3 as well as the shut-off 9 in the cover 1.

A cover 1 is ring-shaped in design and has an upper round opening 1d, in which an elastic rubber membrane 2 is inserted. The membrane 2 is preferably braced on the cover 1 by means of prop cams 2a. The membrane 2 is partially spherical in design and has a large protruding area on top and in the middle. The membrane 2 also lies flush against the exterior of the ring-shaped cover 1. The cover 1 is secured to the valve body 5, preferably by means of a bayonet or prop connection.

Below the membrane 2 is a button 3, which has an upper side 3d that runs parallel to the membrane 2 and basically extends over the area of the opening 1d.

In the position shown in Figure 1, the shut-off 9 is in a position in which the water streams through the canal 11a into the canal 14 and from there exits through an opening 20.

Another insert 21 produces the above mentioned perlator setting. The production of such a perlator jet is generally known to experts.

If the membrane 2 is pressed in according to Figure 1 in the direction of the arrow A, the button 3 is lifted by the membrane and the valve plate 9a is lifted against the retroactive force of the spring 7 from the first valve position 16 and moves against the second valve position 17. The inpouring water now flows from the opening 12 into the canal 13 and from there through another opening 22 into a ring canal 23 and from there exits through the jet openings 18 as a spray.

The shower is therefore switched from the perlator setting to the spray setting by pressing the membrane 2. If the hydraulic pressure is greater than 0.5 bar, for example, the water holds the shut-off 9 in this position against the retroactive force of the spring 7. In order to switch the valve, the cover 1 is turned clockwise around axis B by means of the protruding knob 1c shown in Figure 1. In this process, two ribs 3b of the button 3 intervene with guide curves 5a molded onto the valve body 5. Through this intervention, the button 3 is moved upward with the support of the spring 7. Stops 5e restrict this movement. The pre-stressed spring 7 forces the button 3 against the stop cam 5f. This movement of the button 3 places the garter spring 7 under tension. If the cover 1 is released, the spring 7 swings the button 3 around the axis B back into the position shown in Figure 2. In order for this spring 7 to function as a torsion spring, its ends are accordingly supported in a groove 5c of the valve body 5 and in a groove of the button 3, not shown in detail here.

After the switch, the valve plate 9a once again lies against the first valve position 16 as shown in Figure 1. The water flows through the opening 12 into the canal 14, as mentioned above. This position is maintained by any hydraulic pressure. As mentioned above, the setting is switched by pressing the membrane 2 in the direction of arrow A. Since, as mentioned above, the

membrane 2 protrudes upward and has a large surface, the membrane 2 can also be pressed with the ball of the hand, whereby the showerhead is simultaneously held from the front. Usually, the showerhead is held by hand on the tube part 6b during activation. The pressure point on membrane 2 is not critical, thus it is not necessary to find a certain position. As mentioned above, the shower is reset by turning the cover 1, preferably by means of a protruding knob 1c. As is clear here, the showerhead is for the most part sealed and protected against the penetration of dirt. This is a critical aspect, especially where there are special hygiene requirements.

The present invention therefore makes possible the manufacture of an adjustable showerhead with relatively few sturdy parts, which functions well and is quite ergonomic.

## Patent Claims

1. Showerhead with an outer casing (6), in which is arranged an adjustable valve with a valve body (5) and a shut-off (9) routed through this valve body (5), whereby one end of said shut-off (9) is arranged below a membrane (2) that can be pressed in so that the shut-off (9) can be adjusted to change the stream setting by pressing in the membrane (2) against the retroactive force of a spring (7) from a first valve position (16) to a second valve position (17), with a reset mechanism, whereby the shut-off (9) can be moved from one valve position (17) to another valve position (16), characterized in that the membrane (2) is arranged in a rotating cover (1) and that the shut-off (9) can be moved by rotating the cover (1) from one valve position (17, 16) to the other valve position (16, 17).
2. Showerhead according to claim 1, characterized in that the rotating cover (1) is ring-shaped in design.
3. Showerhead according to claim 1 or 2, characterized in that the cover (1) has a preferably round opening (1d), in which the membrane (2) is inserted flush with the exterior.
4. Showerhead according to one of the claims 1 to 3, characterized in that the cover (1) is arranged in a rotating fashion on the valve body (5) or the outer casing (6).
5. Showerhead according to one of the claims 1 to 4, characterized in that the cover (1) forms a domed unit with the membrane (2).
6. Showerhead according to one of the claims 1 to 5, characterized in that the shut-off (9) has a relatively wide button (3) below the membrane (2).
7. Showerhead according to claim 6, characterized in that the button (3) is positioned inside the cover (1) in an adjustable manner.



8. Showerhead according to claim 6 or 7, characterized in that the button (3) is positioned on a guide curve (5a) of the valve body (5) for switching the shut-off (9).
9. Showerhead according to claim 8, characterized in that the button (3) has ribs (3b) on its underside, which glide along the guide curve (5a) when switched.
10. Showerhead according to one of the claims 6 to 9, characterized in that a spring (7) serving as both a garter spring and a torsional spring is arranged between the button (3) and the valve body (5).
11. Showerhead according to one of the claims 1 to 10, characterized in that the membrane is dome-shaped in design.
12. Showerhead according to claims 1 to 11, characterized in that the membrane is molded to the cover, preferably injection molded.
13. Showerhead according to one of the claims 1 to 12, characterized in that the shut-off (9) is stopped after being switched.

## Summary

The showerhead has an outer casing (6), in which is arranged an adjustable valve with a valve body (5) and a shut-off (9) routed through this valve body (5). One end of the shut-off (9) is arranged below a membrane (2) that can be pressed in so that the shut-off (9) can be adjusted to change the stream setting by pressing in the membrane (2) against the retroactive force of a spring (7) from a first valve position (16) to a second valve position (17). Reset mechanisms are provided, with which the shut-off (9) can be moved from a first valve position (17) to another valve position (16). The membrane (2) is arranged in a rotating cover (1) and the shut-off (9) can be moved by rotating the cover (1) from one valve position (16, 17) to the other valve position (16, 17).